

100-level SUBJECT HANDBOOK ENTRY 2008 – New Generation Subjects

Subject Code	620-158
Title of the subject	Mathematics 2
Credit points	12.5
Coordinator	Karen Baker
Semester of offer	2
Prerequisites	620-157
Mode of delivery	Lectures and tutorials
Contact hours	48 one-hour lectures (four per week), 11 one-hour tutorials (one per week)
Estimated total time commitment	120 hours
Description	<p>This subject develops fundamental concepts and principles in mathematical analysis. Students should gain skills in the practical techniques of differential calculus, integral calculus and infinite series, and study selected applications of these techniques in mathematical modelling.</p> <p>Heuristic and rigorous discussion of limits of real-valued functions, continuity and differentiability. Mean Value Theorem and applications, Taylor polynomials. Riemann integration, techniques of integration and applications, improper integrals. Infinite series. First order differential equations, second order linear differential equations with constant coefficients and selected applications.</p>
Assessment	Up to 25 pages of written assignments 10% (due during semester), a 45-minute written test 10% (held mid-semester), a 3-hour written examination 80% (in the examination period).
Prescribed texts	M. Weir, J. Hass and F. Giordano, <i>Thomas' Calculus</i> , 11th edition, Pearson, 2005.
Notes	<p>This is the second subject of a three-subject sequence (620-157 Mathematics 1, 620-158 Mathematics 2 and 620-2xx Multivariable and Vector Calculus) for students with a very high level of achievement in VCE Specialist Mathematics $\frac{3}{4}$ or equivalent. This subject sequence is equivalent, in content, to the four subjects 620-154, 620-156, 620-2xx Vector Calculus and 620-2xx Real Analysis with Applications, presenting some topics from a more advanced perspective.</p> <p>Students may only gain credit for one of [07]620-113, [07]620-123, [08]620-143, 620-155, 620-158 or [05]620-193.</p>
Subject objectives	<p>Students completing this subject will:</p> <ul style="list-style-type: none"> • understand the significance and applications of properties of functions such as limits,

	<p>continuity and differentiability;</p> <ul style="list-style-type: none"> • be exposed to some fundamental results in real analysis such as the Mean Value Theorem; • be able to evaluate proper and improper Riemann integrals; • develop the ability to determine the convergence and divergence of infinite series; • solve analytically first and second order ordinary differential equations, and use these equations to model some simple physical systems.
<p>Generic skills</p>	<p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include</p> <ul style="list-style-type: none"> • problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; • analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; • collaborative skills: the ability to work in a team; • time management skills: the ability to meet regular deadlines while balancing competing commitments.